DESCRIPTION

FILLING COMPRISING A POLYESTER FIBRE

The present invention relates to a filling comprising a polyester fibre. More particularly it relates to an improved polyester fibre containing filling for use where thermal properties and/or breathability are important, such as in the soft furnishings industry, where it may be used as a filling for bedding, for example duvets, pillows, mattress protectors and sleeping bags or in the clothing industry where it may be used as a filling for coats, anoraks, and the like, particularly ski and winter wear.

Polyester fibre, usually polyethyleneterephthalate, is an inexpensive alternative to down or feathers. However it lacks breathability. In an attempt to improve the characteristics of a filling comprising polyester fibre, the polyester fibre has been blended with natural materials such as, for example, cotton, silk, down and feather.

Considerable effort has been made in the industry to provide an improved synthetic filling and in particular one with improved breathability.

It is an aim of the present invention to provide a synthetic fibrefill with improved breathability but which retains at least some of the desirable properties of polyester fibrefill.

It has unexpectedly been found that cellulosic fibres obtained by an organic solvent spinning process, and in particular one in which the organic solvent is N-methyl morpholine oxide (NMMO) e.g. lyocell, when blended (in

contrast to woven) with a polyester filling fibre such as, for example, polyethyleneterephthalate gives rise to a product with improved characteristics including improved breathability compared to a polyester filling fibre alone. The finding was unexpected given that lyocell fibres are traditionally flat and would not have been expected to be a good filling fibre. Lyocell is a cellulosic fibre made by direct dissolution of wood pulp in an organic solvent and has to date been used primarily in the development of technical textiles, namely woven fabrics comprising interlaced warp and weft threads.

It is another aim of the present invention to provide a synthetic fibrefill with improved thermal performance.

It has unexpectedly been found that cellulosic fibre e.g. lyocell, when blended with a polyester filling fibre, such as, for example, polyethyleneterephthalate gives rise to a product with improved thermal characteristic compared to the component fibres alone.

According to the present invention there is provided a non-woven blend comprising or consisting of a polyester filling fibre and a cellulosic fibre obtained by an organic spinning process.

Preferably the cellulosic fibre is lyocell.

Preferably the polyester filling fibre is polyethyleneterephthalate fibre.

Preferably the blend comprises, by weight, no more than 80%, more preferably still 60%, of the cellulosic fibre, for example, lyocell.

More preferably the cellulosic fibre, for example, lyocell is present in an amount of from 10 - 60% by weight and ranges therebetween, more

preferably still 20- 60% and more preferably still from 25- 60% of the blend.

Preferably the polyester filling fibre comprises mono fibres which are crimped or conjugate fibres. By conjugate fibres is meant fibres comprising two different fibre-forming polymeric units arranged side by side so that on heat treatment the fibre becomes spirally crimped.

Preferably the cellulosic or lyocell fibre is a saw-toothed crimp fibre.

More preferably the cellulosic or lyocell fibres and polyester filling fibres are formed into a fibre ball. To form a fibre ball it is preferred to use a lyocell cellulosic fibre blended with a conjugate polyester preferably of polyethyleneterephthalate.

Alternatively a lyocell cellulosic fibre and either a conjugate polyester or a regular saw tooth crimp polyester fibre are blended, carded and layered into a wadding. For the avoidance of doubt a wadding is neither a woven product nor a fabric.

Preferably the wadding is more than 3 mm thick and more preferably more than 5 mm thick. It is a loose open material in contrast to compressed materials such as for example felts.

According to a further aspect of the present invention there is provided a bedding article comprising as a filling a non-woven blend of the invention.

According to a further aspect of the present invention there is provided an article of clothing comprising as a filling a non-woven blend of the invention.

The bedding article may be, for example, a duvet, pillow, quilt,

sleeping bag, cushion or other similar article.

The clothing article may be, for example, a jacket, coat, or anorak.

The non-woven blend has characteristics which make it more desirable than a polyester filling, for example, polyethyleneterephthalate alone:

1) it has a more down like feel;

2) weight for weight it is warmer than polyethyleneterephthalate; and

3) It is breathable, i.e. moisture absorbent;

Fibreballs of the non-woven blend also show improved breathability and thermal properties.

The blending of fibres, and the production of fibre balls are well known processes to the man skilled in the art and are not therefore described herein.

The invention will be further described, by way of example only, with reference to the tabulated test data shown in tables 1 and 2 below:

Table 1 shows the products under test; and

Tables 2 and 3 show the properties of the products under test.

It should be noted with reference to table 1 that pure lyocell has a fill weight of 49.3 gm/m^2/tog, which is similar to the figure of 49 gm/m^2/tog for pure polyester. The blend however gives a figure of 39 gm/m^2/tog ie a synergistic and non obvious effect is achieved with a mixture.

TABLE 1

	Duvet Weight	U.K. Tog Test	Fill wgt gm/m^2/tog
Cellulosic/ Polyester Carded Blend	2060g	13.5	37
Goose down	1790g	13.5	18
Hollow Polyester fibre Carded	2488g	13.5	49

TABLE 2

	THERMOREGULATORY MODEL OF MAN (MANNIKIN) EFFECTIVE IN USE DATE									
	Thermal Insulation (High best)	% Difference From Cellulosic	Effective Water Vapour Resistance (low best)	% Difference From Cellulosic	Water Vapour permeability (high best)	% Difference From Cellulosic	Ratio of Thermal Insulation to weight (high best)	% Difference From Cellulosic	Thermal Physiological Comfort (temp.°C) (low best)	% Difference From Cellulosic
Cellulosic/Polyester Carded Blend	7.8		841		0.56		379		5.5°C	
Goose down	7.3	-6.4%	845	+0.5%	0.52	-7.1%	490	+29%	7.1°C	+29%
Hollow polyester fibre	7.21	-7.6%	840	-0.1%	0.51	-8.8%	290	-23%	7.40°C	-35%
	THIS IS WARMTH RATING		THIS IS THE RESISTANCE TO WATER VAPOUR INVASION		THIS IS THE BREATHABILITY MOISTURE TRANSPORT PROPERTIES		WARMTH TO WEIGHT RATIO		MINIMUM TEMPERATURE BEFORE DISTURBED SLEEP	

TABLE 3

	THERMOREGULATORY MODEL OF SKIN			
	Water Vapour Take-up (gm/m^2) (high best)	% Difference From Cellulosic	Buffering Capacity Moisture Transport & Take-up properties	% Difference from Cellulosic
Cellulosic/Polyester Carded Blend	42.0		5.0	
Goose down	42.8	+ 1.9%	4.1	- 18%
Hollow polyester fibre	26.5	-36.9%	4.1	- 18%
	ABILITY TO REMOVE WATER VAPOUR QTY RATE OF MOISTURE ABSORBANCE		ABILITY TO TRANSPORT MOISTURE AWAY FROM BODY FROM SWEAT PULSE	

It will be noted from test results shown in tables 2 and 3 that the non-woven blend of the invention is significantly better than pure polyester (the current synthetic filling of choice) when it comes to its thermal insulation properties, its water vapour permeability index, its ratio of thermal insulation to weight, its thermal physiological comfort, its water vapour take up and its buffering capacity moisture transport and uptake properties and only insignificantly worse in its effective water vapour resistance. In other words, the non-woven blend confers a higher degree of thermal insulation and possesses better moisture transport properties under stationary conditions combined with better moisture absorption than a pure polyester material.